Fall, 2005

Summary Report of the Iowa Text Reader Project 2004-2005

Project Overview

In Iowa's attempt to find effective interventions to close the achievement gap between students with disabilities and their non-disabled peers, the Iowa Assistive Technology Text Reader project was developed. A collaborative committee developed tools, professional development materials, and data collection analysis used in the project. The Iowa Assistive Technology Text Reader Project used a descriptive and correlational design to look at the relationship of student reading (fluency and comprehension) and the use of text reader software with embedded study skills.

Software, training and support were provided through the Iowa Department of Education, Bureau of Children, Family, and Community Services; Iowa Program for Assistive Technology (IPAT), Area Education Agencies (AEAs), Local Education Agencies (LEAs), and Kurzweil Education Systems Inc. During the 2004-2005 school year, training was provided to project implementers in the following areas:

- use of Kurzweil 3000 with embedded study skills
- curriculum-based measurement strategies
- Levels of Use interviews
- on-line Concerns implementation surveys
- teacher impact surveys
- student impact surveys

Originally, 90 students attending rural or urban schools across the state of Iowa were selected for this study. The selection criteria were as follows:

- students in grade six or grade seven
- students with Individual Education Programs (IEP), demonstrating mild to moderate disabilities (Levels 1 or 2)
- evidence of reading goals in the area of reading comprehension, reading fluency, or vocabulary
- students scoring in the non-proficient range on the reading subtests of the Iowa Test of Basic Skills

From November 2004 to May 2005, data were gathered on 73 students (81%) meeting the above criteria. Attrition was due to students moving out of districts and technical difficulties. Of the 73 participating students: 84% were Level 1 students, 16% were Level 2 students. The average time spent in general education environments, Least Restrictive Environment (LRE), was 62%.

Data Collection

Students used Kurzweil 3000, a text reader with embedded study skills, to access reading in content curriculum such as social studies, science, language arts or other selected curricula. The following data were collected:

Reading fluency and comprehension data

Reading data were collected on reading fluency and reading comprehension every other week using Jamestown passages.

Levels of Use Survey and Concerns Survey

The Concerns Based Adoption Model (CBAM) was used to monitor the implementation of the study. The Levels of Use Interviews were completed twice a month. The Concerns Survey for implementers and administrators was completed quarterly to follow participant perceptions of the strategy

Student Survey and Teacher Survey

Students and teachers completed impact surveys. They reported their impressions of the effectiveness of the text reader with embedded study skills.

ITBS scores

The Iowa Test of Basic Skills (ITBS) scores from 2003 – 2004 school year were used as baseline data in the domains of reading comprehension, vocabulary, and reading composite. These outcome measures will be collected for the 2004 – 2005 and 2005 - 2006 school years. This process will provide longitudinal data regarding the impact on academic performance.

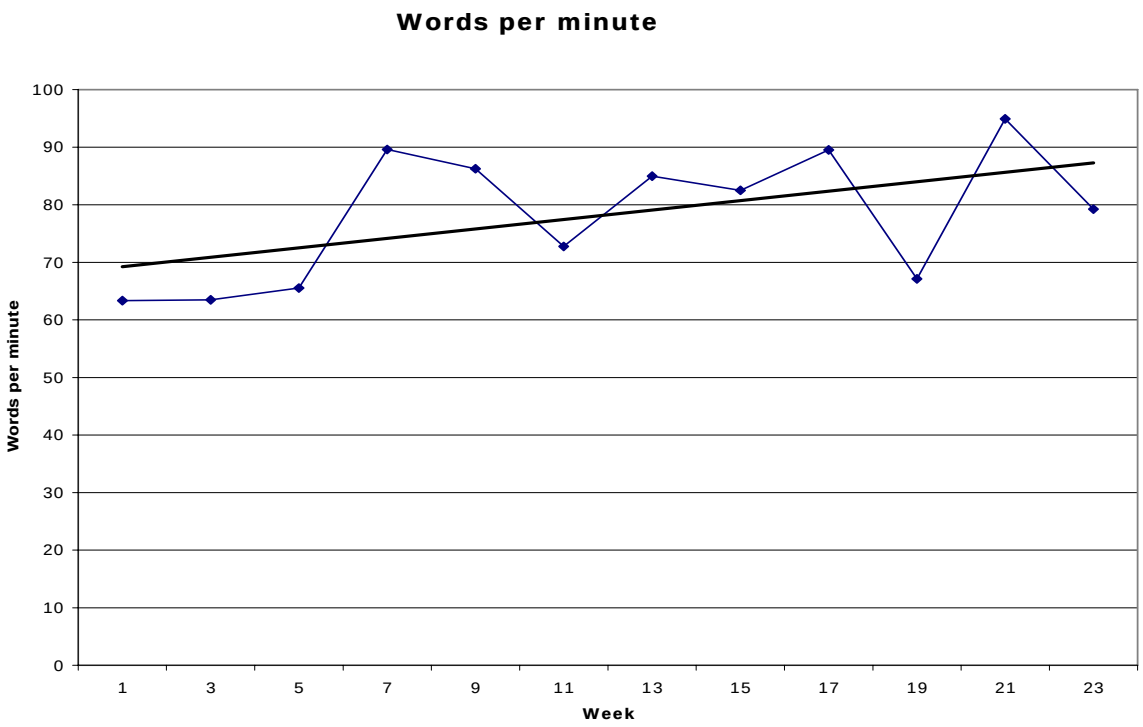
Summary of Results

Curriculum-based measures

Curriculum-based assessment strategies were used to collect reading fluency and comprehension data. Progress was measured twice a month. Students read a 200 word passage from the sixth grade level of the Jamestown Reading Series. This reading series provides controlled vocabulary content.

Reading fluency (words per minute)

The data show a positive trend in reading fluency. Words per minute increased over the 23 week period of data collection. In week one, the average reading rate was 63 words per minute. By week 23, the average reading rate was 79. The average reading rates improved by 16 words per minute. Scores were rounded to the nearest whole number. The mean words per minute for each week of data collection, along with the regression trendline, are shown in the following figure.

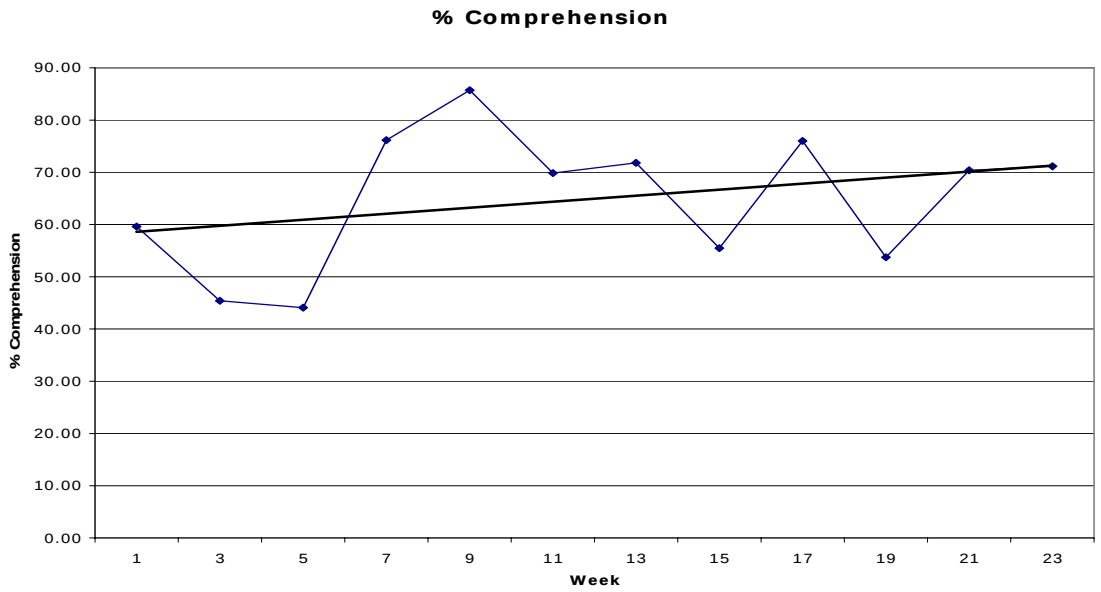


Fuchs, Fuchs, Hamlett, Walz, & Germann (1993) report that the realistic weekly improvement rate in reading fluency for sixth grade special education students is .3 words per week. Fuchs work equates to 7 words per minute in a 23 week period.

This study's implementation of a text reader with study skills resulted in an average increase of .75 words per week. The results of this study indicate an average increase of 16 words per minute in a 23 week period. With this rate of improvement, one could conclude at this rate students could meet aggressive reading goals.

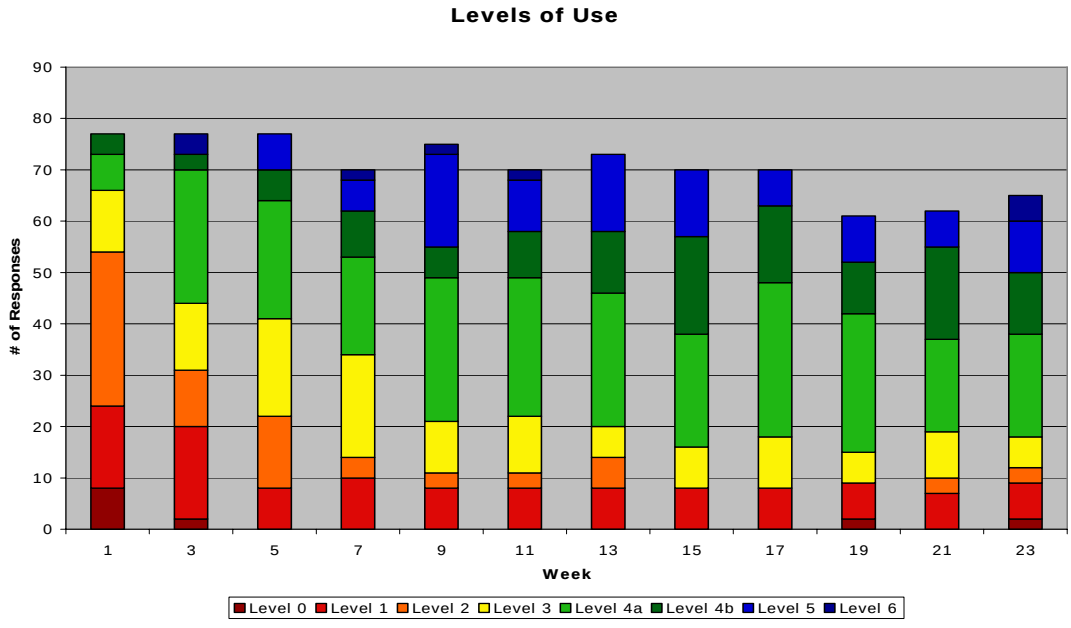
Reading Comprehension

The data showed a positive trend in the comprehension scores over the 23 week period. The average comprehension score improved by 13% per student. There is considerable variability in the actual scores. Further analysis showed that the readability of the passages varied across 2 grade levels.



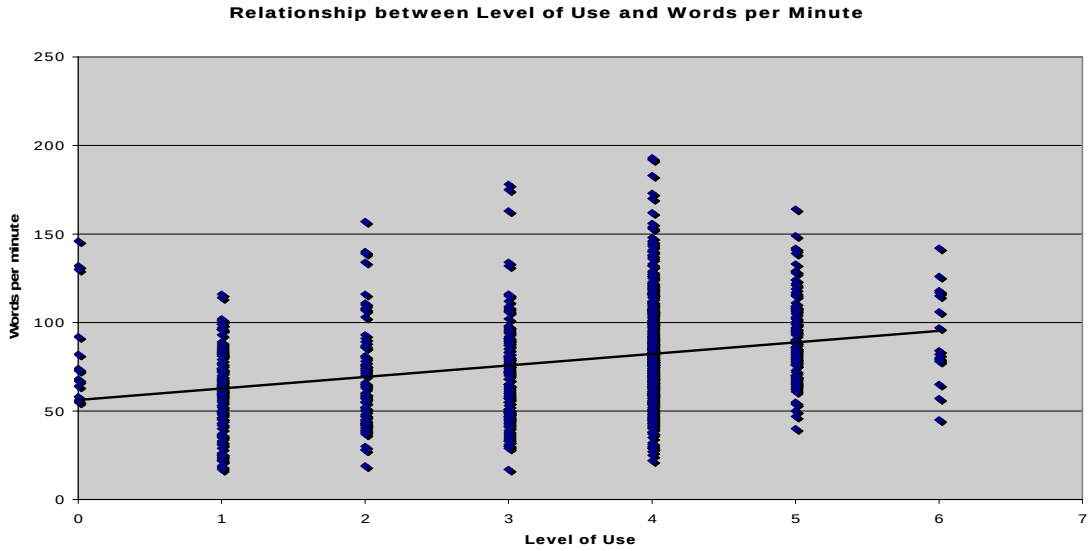
Levels of Use Interview

Every other week as part of the implementers' contact with the district staff, the Levels of Use Interview was completed. The resulting data demonstrated a developmental pattern moving from low level of use (red and orange) to highly collaborative stages of use (green and blue). In some cases, resistance to implementation due to time management and technical issues were apparent.



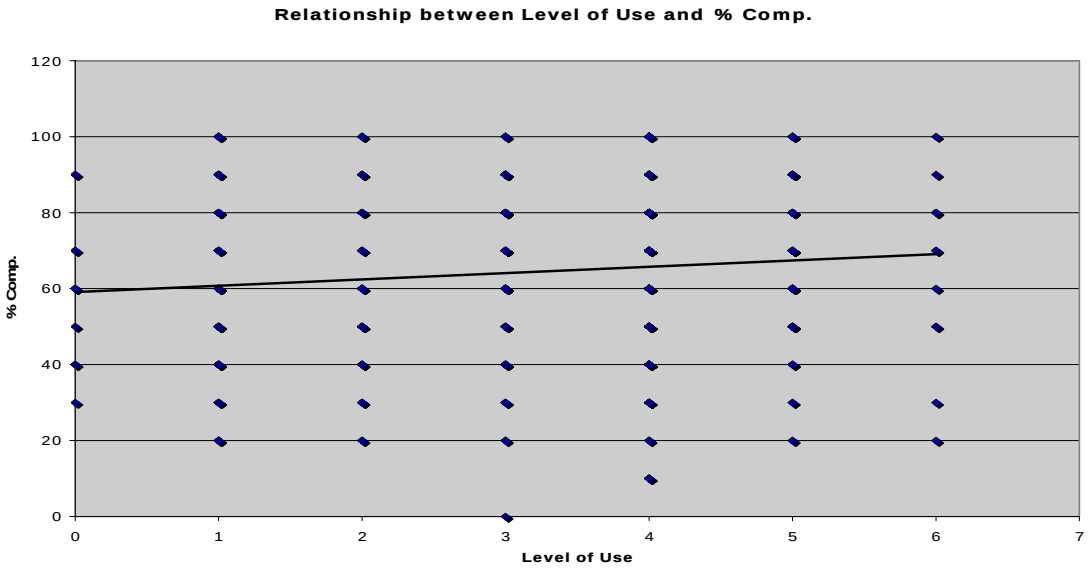
Relationship between Level of Use and Words per Minute

There was a highly significant correlation between level of use and words per minute, r (760 df) = 0.295535787, p<.0001. This relationship can be seen graphically in the following figure. For the purpose of calculating this correlation, levels 4a and 4b were both treated as 4. One possible explanation for this relationship is that as teachers increase their implementation skills, student academic achievement improves. Further research would be needed to determine this.



Relationship between Levels of Use and Percent Questions Correct

A small but significant correlation occurred between level of use and the percent of questions correct, r(760 df)= 0.105764656, p=.003487. This relationship is shown graphically in the following figure.



Concerns Survey

This survey was completed quarterly by the AEA implementers, building principals, and participating teachers as a guide to implementation. Concerns are neither positive nor negative in nature; they are areas of notable interest. Implementers focused on areas of management and collaboration. However, the collaboration difficulties appear to be largely due to time related issues. The administrator responses focused on concerns for collaboration and consequences for student performance.

Student Survey

Forty-three students (59%) completed an online survey assessing their impressions of the project and the impact of the text reader software on their access to the general education curriculum. 95% liked the software. 91% thought it was pretty easy or very easy to learn. 93% reported it helped them with their reading. 72% reported it helped them stay on task. 86% reported it helped them work better independently. 79% reported it helped them earn better grades on tests. 56% reported it helped them have better attendance at school. 77% reported it helped them feel better about themselves. 75% reported it helped interest them in what they were learning. 84% reported it helped them understand what was written in their books. 81% reported it helped them get their work done. 58% reported it improved how well they wrote. See attached survey results.

When asked, " How else has the Kurzweil text reader software helped you?" students commented that it helped them complete their homework, catch up in class, made schoolwork more interesting, and helped them understand their work.

Teacher Survey

Nine teachers (45%) completed the online survey assessing their impressions of the project and the impact of the text reader software. 100% liked using the Kurzweil text reader. 78% said it was easy to use. 33% thought it was somewhat difficult to use while none said it was very difficult to use. 100% reported it helped their students read. 100% reported it helped their students stay on task. 100% reported it helped their students work independently. 88.9% reported it helped their students get better grades on tests. 22% reported it increased attendance at school. 89% reported it helped students feel better about themselves. 89% reported it improved students' interest in what they are learning. 100% reported it helped students understand what is written in their books. 100% reported it helped students complete their work. 55% reported it helped students improve how well they wrote. See attached survey results.

When asked advantages and disadvantages of participating in this study, they commented positively on receiving the software and training, the variety of study skills which met students' learning styles, and the acquisition of an additional learning tool. Concerns expressed focused on the time commitment of scanning and editing the text and technical problems setting up the system.

Discussion

The experience of the Iowa Text Reader Project highlighted the difficulties of conducting action based research. The original design included matched subjects and controls. As Edyburn (2005) stated, "assistive technology consideration mandates that students with disabilities will have access to appropriate devices and services." After attempting to match subjects and controls proved too difficult, the design had to be modified. The training demands, the technological difficulties, and supports needed to maintain the study's integrity of implementation proved very challenging. All these issues are being taken into account in developing the project design for Year Two.

The outcomes document improved reading fluency and comprehension as well as very positive subjective responses from the students and teachers implementing the text reader project. Positive outcomes they associated with the use of the text reader software included improved academic performance, better on task behavior, more engagement in the instructional materials, and improved independent work completion.

Areas of further research were identified. During Year Two, the Iowa Text Reader Project will use the Time Series Concurrent and Differential (TSCD) Approach (Smith, 2000) to study the enhanced performance of students using a text reader by comparing student comprehension on passages read with and without the text reader. Twice a month students will be tested on comprehension of passages presented either in print or with Kurzweil 3000 software. Each reading passage will be presented to one half the group in print while the other half will access the passage using Kurzweil 3000. In this way, issues with passage readability will be controlled. The order of presentation will also be varied. These repeated measures over time with and without assistive technology should provide evidence of the impact and outcome of assistive technology use. The expectation would be that enhanced performance would be evident and the achievement gap would narrow.

Summary

Seventy-three students from across the state of Iowa participated in a 23 week study of the impact of the use of a text reader software program on multiple measures of academic performance. Enhanced performance was observed in the areas of reading fluency and comprehension. Positive correlations were found between the teachers' level of implementation and the students' progress on reading fluency and comprehension. Both the students and teachers participating reported strong positive feelings on feedback surveys linking the use of the text reader to a variety of positive school behaviors. Areas for further study were identified.

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We wish to pay our respects to Roger Rachow (AEA 13). Roger was a pioneer in the field of Assistive Technology in Iowa and the primary motivator for this project. Without his insights and experience with text readers, the project would not have moved forward at the pace it did nor garnered the results it did. Roger was first and foremost and an advocate for children with disabilities. We will miss him. He passed away in June of 2005.

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Disclaimer:
While software, training and support were provided through the Iowa Department of Education, Bureau of Children, Family, and Community Services; Iowa Program for Assistive Technology (IPAT), Area Education Agencies (AEAs), Local Education Agencies (LEAs), and Kurzweil Education Systems Inc., this study was the independent work of Iowa Assistive Technology Liaisons.